

Intel Corporation
4040 Lafayette Center Drive
Chantilly, VA 20151

SEP 29 2006

Page 1 of 32

FAX

Urgent and Confidential

Date: September 29, 2006

TO: USPTO
 Examiner Tse W. CHEN
 Art Unit 2116
 Fax Number 571-273-8300

FROM: Joni Stutman-Horn
 Fax Number 703-633-0933
 Phone Number 703-633-6845

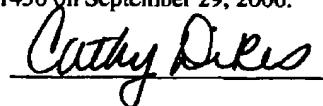
SUBJECT: Application Number 10/015,533
 Inventor(s) Andrew J. Fish et al.
 Date Filed December 11, 2001
 Docket Number P11062
 Title System and Method To Extend Firmware Capabilities
 By Loading Firmware Extensions From A Boot Media

INCLUDED IN THIS TRANSMISSION:

Fax Cover Sheet	1 page
Fee Transmittal	1 page
Transmittal	1 page
Appeal Brief	29 pages

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Cathy Dikes

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TRANSMITTAL
FORM

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Total Number of Pages in This Submission

32

Application Number	10/015,533
Filing Date	December 11, 2001
First Named Inventor	Andrew J. Fish
Art Unit	2116
Examiner Name	Tse W. Chen
Attorney Docket Number	P11062

ENCLOSURES (Check all that apply)

<input checked="" type="checkbox"/> Fee Transmittal Form <input type="checkbox"/> Fee Attached <input type="checkbox"/> Amendment/Reply <input type="checkbox"/> After Final <input type="checkbox"/> Affidavits/declaration(s) <input type="checkbox"/> Extension of Time Request <input type="checkbox"/> Express Abandonment Request <input type="checkbox"/> Information Disclosure Statement <input type="checkbox"/> Certified Copy of Priority Document(s) <input type="checkbox"/> Reply to Missing Parts/ Incomplete Application <input type="checkbox"/> Reply to Missing Parts under 37 CFR 1.52 or 1.53	<input type="checkbox"/> Drawing(s) <input type="checkbox"/> Licensing-related Papers <input type="checkbox"/> Petition <input type="checkbox"/> Petition to Convert to a Provisional Application <input type="checkbox"/> Power of Attorney, Revocation <input type="checkbox"/> Change of Correspondence Address <input type="checkbox"/> Terminal Disclaimer <input type="checkbox"/> Request for Refund <input type="checkbox"/> CD. Number of CD(s) _____ <input type="checkbox"/> Landscape Table on CD	<input type="checkbox"/> After Allowance Communication to TC <input type="checkbox"/> Appeal Communication to Board of Appeals and Interferences <input checked="" type="checkbox"/> Appeal Communication to TC (Appeal Notice, Brief, Reply Brief) <input type="checkbox"/> Proprietary Information <input type="checkbox"/> Status Letter <input checked="" type="checkbox"/> Other Enclosure(s) (please identify below): Fax Cover Sheet
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SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

Firm Name	Intel Americas		
Signature	/Joni Stutman-Horn/		
Printed name	Joni Stutman-Horn		
Date	September 29, 2006	Reg. No.	42,173

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Typed or printed name	Cathy Dikes	Date	September 29, 2006

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Effective on 12/08/2004.

Fees pursuant to the Consolidated Appropriations Act, 2005 (H.R. 4818).

FEE TRANSMITTAL

For FY 2005

Applicant claims small entity status. See 37 CFR 1.27

TOTAL AMOUNT OF PAYMENT (\$ 500.00)

Complete If Known

Application Number	10/015,533
Filing Date	December 11, 2001
First Named Inventor	Andrew J. Fish
Examiner Name	Tse W. Chen
Art Unit	2116
Attorney Docket No.	P11062

METHOD OF PAYMENT (check all that apply)

Check Credit Card Money Order None Other (please identify): _____

Deposit Account Deposit Account Number: 50-0221 Deposit Account Name: Intel Corporation

For the above-identified deposit account, the Director is hereby authorized to: (check all that apply)

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 Charge any additional fee(s) or underpayments of fee(s) under 37 CFR 1.16 and 1.17 Credit any overpayments

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FEE CALCULATION

1. BASIC FILING, SEARCH, AND EXAMINATION FEES

Application Type	FILING FEES		SEARCH FEES		EXAMINATION FEES		Fees Paid (\$)
	Fee (\$)	Small Entity Fee (\$)	Fee (\$)	Small Entity Fee (\$)	Fee (\$)	Small Entity Fee (\$)	
Utility	300	150	500	250	200	100	
Design	200	100	100	50	130	65	
Plant	200	100	300	150	160	80	
Reissue	300	150	500	250	600	300	
Provisional	200	100	0	0	0	0	

2. EXCESS CLAIM FEES

Fee Description

Each claim over 20 (including Reissues)

Small Entity

Fee (\$)

Fee (\$)

Each independent claim over 3 (including Reissues)

Fee (\$)

Fee (\$)

Multiple dependent claims

Fee (\$)

Fee (\$)

Total Claims	Extra Claims	Fee (\$)	Fee Paid (\$)	Multiple Dependent Claims	Fee (\$)	Fee Paid (\$)
- 20 or HP =	0	x 50.00	= 0			

HP = highest number of total claims paid for, if greater than 20.

Indep. Claims	Extra Claims	Fee (\$)	Fee Paid (\$)
- 3 or HP =	0	x 200.00	= 0

HP = highest number of independent claims paid for, if greater than 3.

3. APPLICATION SIZE FEE

If the specification and drawings exceed 100 sheets of paper (excluding electronically filed sequence or computer listings under 37 CFR 1.52(e)), the application size fee due is \$250 (\$125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).

Total Sheets	Extra Sheets	Number of each additional 50 or fraction thereof	Fee (\$)	Fee Paid (\$)
- 100 =		/ 50 = (round up to a whole number) x		

4. OTHER FEE(S)

Non-English Specification, \$130 fee (no small entity discount)

Other (e.g., late filing surcharge): Appeal Brief

Fees Paid (\$)

500.00

SUBMITTED BY

Signature	/Joni D. Stutman-Horn/	Registration No. 42,173 (Attorney/Agent)	Telephone 703-633-6845
Name (Print/Type)	Joni D. Stutman-Horn		Date September 29, 2006

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SEP 29 2006

PATENT
Attorney Docket No. 10559-628001/P11062**BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES**

In re Patent Application of:)
 Andrew J. Fish, et al.)
 Application No.: 10/015,533) Examiner: Chen, Tse W.
 Docket No.: P11062) Art Unit: 2116
 Filed: Dec. 11, 2001))
) VIA FAX (571) 273-8300
))

For: **SYSTEM AND METHOD TO EXTEND FIRMWARE CAPABILITIES BY
LOADING FIRMWARE EXTENSIONS FROM A BOOT MEDIA (as amended)**

APPEAL BRIEF

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Appellant submits herewith an Appeal Brief as required by 37 C.F.R. § 41.37. This Appeal Brief is in response to the Final Office Action dated Mar. 1, 2006 and the Advisory Action dated Jul. 21, 2006.

I. REAL PARTY IN INTEREST

The real party in interest is Intel Corporation, a corporation of Delaware.

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By: Cathy Dikes
Cathy Dikes

Date: September 29, 2006

SEP 29 2006

Attorney Docket No.:P11062
Application No.: 10/015,533
Page 2**II. RELATED APPEALS AND INTERFERENCES**

There are no other appeals or interferences known to Appellant which relate to, directly affect or are directly affected by the Board's decision in this appeal.

III. STATUS OF THE CLAIMS:

Claims 1-20 remain pending.

Claims 1-3, 5-8 and 17-19 stand finally rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,835,760 to Harmer in view of *Extensible Firmware Interface Specification – Draft for Review* (hereinafter, "EFIS").

Claims 4 and 20 stand finally rejected under 35 U.S.C. § 103(a) as being unpatentable over Harmer and EFIS and further in view of BIOS Updates.

Claims 9-11 and 13-16 stand finally rejected under 35 U.S.C. § 103(a) as being unpatentable over Harmer and EFIS and further in view of U.S. Patent No. 5,987,912 to Rakavy et al.

Claim 12 stands finally rejected under 35 U.S.C. § 103(a) as being unpatentable over Rakavy et al., Harmer and EFIS, and further in view of Unicode Technical Report #10, (hereinafter, UTR).

The rejections of claims 1-20 are appealed. These claims are reproduced in the attached Claims Appendix.

IV. STATUS OF AMENDMENTS:

A Response After Final was filed on June 30, 2006. Amendments submitted in that Response were not entered, as the Examiner asserted in the Advisory Action, because "they are not deemed to place the Application in better form for appeal. Thus, the attached claims are reproduced as they were before that response. This refusal to enter the amendments is respectfully traversed, as discussed below. Specifically, Claim 1 was amended to recite an "operating system environment" to further distinguish from a mere device driver. The medium is further described as a machine-readable boot medium. None of the cited prior art teaches a medium having firmware extensions read from a medium which may act as a *boot* medium. The submitted amendments are attached in Section XI. UN-ENTERED AMENDMENTS.

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Attorney Docket No.: P11062
Application No.: 10/015,533
Page 3V. SUMMARY OF THE INVENTION:

Regarding independent claim 1, a system comprises a central processor (page 6, lines 12-18; Fig. 1, 110) coupled with non-volatile memory (page 7, lines 7-9; Fig. 1, element 120) which stores platform firmware (page 11, lines 13-18; Fig. 2A, element 206). The system has an extensible firmware interface (EFI) architecture (page 12, line 2 through page 16, line 8; Fig. 2B) comprising data tables having platform-related information, a loader for an operating environment, and boot and runtime service calls available to the operating environment, wherein the EFI enables extension of platform firmware (page 16, lines 10, et seq.; Fig. 3, element 300) by loading driver and application images (page 19, lines 1-2; page 4, lines 21, et seq.; Fig. 4, block 405), which when loaded, have access to all EFI defined runtime and boot services (page 14, line 19 to page 15, line 2; Fig. 2B, elements 226 and 228). A machine-readable medium (page 8, lines 5, et seq.; Fig. 1, elements 130 and 135) is to be coupled with the central processor and used in initializing the operating environment (page 18, line 21 to page 19, line 5; Fig. 4, blocks 405, 410, 415) for the system upon power up. The machine-readable medium comprises a first set of instructions forming at least a portion of the operating environment (page 17, lines 23-25; Fig. 3, element 320), and a second set of instructions defining one or more firmware extensions (page 16, lines 18-25 and page 17, lines 1-25; Fig. 3, element 310) to enable the system to access the first set of instructions, wherein the one or more firmware extensions comprise a self-describing media module (page 5, lines 7-12; page 18, lines 1-20).

Regarding independent claim 7, a self-describing machine-readable medium (page 5, lines 7-12; page 18, lines 1-20; page 8, lines 5, et seq.; Fig. 1, elements 130 and 135) comprises a first set of instructions (page 16, lines 18-25 and page 17, lines 1-25; Fig. 3, element 310) in a first portion of the medium defining operations for enabling a machine to access a second set of instructions (page 17, lines 23-25; Fig. 3, element 320) in a second portion of the medium comprising at least a portion of an operating system stored on the machine-readable medium in a format that is unreadable (page 18, lines 6-10) by the machine before the machine loads the first set of instructions, wherein the first set of instructions comprises at least one extensible firmware interface (EFI) image (page 14, lines 19-22) providing a software abstraction enabling access to the second portion of the medium, wherein platform firmware of the machine does not have a mechanism to access the second portion of the medium prior to accessing the EFI image; and the second set of instructions (page 18, lines 6-10).

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Regarding independent claim 13, a machine-implemented method for extending platform firmware capabilities comprises loading on a system one or more firmware extensions from a boot media (page 18, line 21 to page 19, line 5; Fig. 4, block 405); booting the system (page 18, line 21- page 19, line 5; Fig. 4, block 410); and loading and running an operating system loader from the boot media using the one or more loaded firmware extensions (page 18, line 21 to page 19, line 5; Fig. 4, block 415), the one or more loaded firmware extensions enabling the system to access the operating system loader from a portion of the boot media inaccessible to the unextended platform firmware (page 18, lines 6-10), wherein the one or more firmware extensions are compatible with an extensible firmware interface (EFI) comprising data tables having platform-related information, a loader for an operating system, and boot and runtime service calls available to the operating system (page 12, line 2 to page 16, line 8; Fig. 2B), wherein the EFI enables extension of platform firmware by loading application images (page 19, lines 1-2; page 4, lines 21, et seq.; Fig. 4, block 405), which when loaded, have access to all EFI defined runtime and boot services (page 14, line 19 to page 15, line 2; Fig. 2B, blocks 226, 228), the system having an EFI architecture.

Regarding independent claim 17, a data processing system comprises means for processing instructions and data (page 6, lines 12-18; Fig. 1, element 110); non-volatile memory means for storing platform firmware (page 7, lines 7-9; Fig. 1, element 120); and self-describing mass storage means (Fig. 1, elements 130 and 135) providing means for extending platform firmware capabilities during system booting before an operating system loader is loaded and run (page 16, lines 10, et seq.; Fig. 3; Fig. 4, block 405; page 14, line 19 to page 15, line 2; Fig. 2B , blocks 226 and 228), wherein means for extending platform firmware capabilities comprises an extensible firmware interface (EFI) image (page 19, lines 1-2; page 4, lines 21, et seq.; Fig. 4, block 405) residing on the self-describing mass storage means (page 5, lines 7-12; page 18, lines 1-20), the image providing a software abstraction enabling access to a second portion of the mass storage means comprising at least a portion of the operating system loader (page 13, lines 2-14; Fig. 2B, elements 222 and 224; page 14, line 24 to page 15, line 8; Fig. 2C, element 260; page 16, lines 18-23; page Fig. 3, element 320; Fig. 4, block 415), wherein platform firmware of the machine does not have a means to access the second portion of the medium prior to accessing the EFI image (page 18, lines 6-10).

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Attorney Docket No.: P11062
Application No.: 10/015,533
Page 5VI. GROUNDS OF REJECTION:

- A. Claims 1-3, 5-8 and 17-19 stand finally rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,835,760 to Harmer in view of *Extensible Firmware Interface Specification – Draft for Review* (hereinafter, “EFIS”).
- B. Claims 4 and 20 stand finally rejected under 35 U.S.C. § 103(a) as being unpatentable over Harmer and EFIS and further in view of BIOS Updates.
- C. Claims 9-11 and 13-16 stand finally rejected under 35 U.S.C. § 103(a) as being unpatentable over Harmer and EFIS and further in view of U.S. Patent No. 5,987,912 to Rakavy et al.
- D. Claim 12 stands finally rejected under 35 U.S.C. § 103(a) as being unpatentable over Rakavy et al., Harmer and EFIS, and further in view of Unicode Technical Report #10, (hereinafter, “UTR”).

VII. ARGUMENT:

- A. Claims 1-3, 5-8 and 17-19 are patentable over Harmer in view of EFIS.

1. Harmer fails to teach or suggest that the machine-readable medium is a self-describing media module forming at least a portion of the operating environment for use in initializing the system upon power up.

Appellant respectfully traverses the § 103(a) rejection of claims 1-3, 5-8 and 17-19 over Harmer in view of EFIS. A prima facie case of obviousness has not been established, because the references as combined fail to teach or suggest all elements of the claims.

Independent claim 1 requires a system including, *inter alia*, “the machine-readable medium to be used in initializing the operating environment for the system upon power up, the machine-readable medium comprising a first set of instructions forming at least a portion of the operating environment, and a second set of instructions defining one or more firmware extensions to enable the system to access the first set of instructions, wherein the one or more firmware extensions comprise a self-describing media module.” Harmer and EFIS, even if it were proper to combine them, fail to teach or suggest the system as set forth in claim 1.

Pages 2-3 of the Final Office Action alleges that Harmer teaches a medium comprising “a first set of instructions forming at least a portion of the operating environment, and a second

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set of instructions defining one or more firmware extensions to enable the system to access the first set of instructions, wherein the one or more firmware extensions comprise a self-describing media module," [emphasis added] citing [Col. 9, lines 49-54; Col. 9, lines 26-29; and Col. 9, line 40]. The Examiner has misunderstood the purpose of Applicants' invention and has made erroneous assumptions about the teachings of Harmer. Applicants' recited claims require that the first set of instructions define one or more firmware extensions *forming at least a portion of the operating environment*. Harmer does not teach a firmware extension that is related to the operating environment. Harmer teaches a firmware extension that is meant to be loaded on the host computer to "properly initialize and operate device 114." [Col. 9, lines 26-29] It will be understood by one of skill in the art that operating the device means a "device driver." It will also be understood that the firmware extension taught by Harmer is this device driver (e.g., the code to initialize and operate the device). Storing device drivers on option-ROMs is known in the art. However, in order to load the device driver, the system needs to know, in advance, how to read the data from the device. The advantage taught by Harmer is that a portion of the device driver code may now also reside on the mass media storage instead of being limited only to the ROM. In contrast, claim 1 requires that the medium comprises a *second set of instructions defining one or more firmware extensions to enable the system to access the first set of instructions*. Thus, as explicitly recited in the claim, it is the second set of instructions that form the "device driver," or file system driver information, and the first set of instructions form a portion of the operating environment, i.e., a portion of the operating system.

In contrast, Harmer teaches or suggests only that a first set of instructions exist to enable the system to load a device driver to access other, non-described data, on a mass storage device. Harmer does not teach or suggest that a second set of instructions enables the system to access the first set of instructions which form a part of the operating environment. It will be clear to those of ordinary skill in the art that Applicants' claimed invention enables the system to boot from the mass media device that would be unreadable to existing firmware and OS loaders. Specifically, the system reads the second set of instructions (which are self-describing for the medium) and extends the firmware with a code to operate the device. Now that the system can operate the device, it can read and load the first set of instructions that form at least a portion of the operating environment. In contrast, Harmer teaches only one set of instructions, comprising the device driver code. Thus, a *prima facie* case of obviousness has not been established, at least

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because Harmer fails to teach or suggest a self-describing media device that comprises both instructions to operate the device and instructions forming a portion of the operating environment, as recited in claim 1.

Pages 2-3 of the Final Office Action points to col. 9, lines 49-54, of Harmer as allegedly teaching the first set of instructions, and to Col. 9, lines 26-29, allegedly teaching that the instructions form a portion of the operating environment, and to Col. 9, line 40, allegedly teaching the second set of instructions defining one or more firmware extensions to access the first set of instructions. The Advisory Action alleges that the specification does not describe that the device contains information required to read the remainder of the device media.

Page 5 of the Final Office Action alleges that EFIS teaches "wherein the first set of instructions comprises at least one extensible firmware interface (EFI) image providing a software abstraction enabling access to the second portion of the medium, wherein platform firmware of the machine does not have a mechanism to access the second portion of the medium prior to accessing the EFI image," citing page 1, lines 3-4 fig. 2-1 and page 13, lines 1-3.

In fact, Harmer teaches that the expansion BIOS (option-ROM) contains only a portion of the device driver (e.g., code to operate the device) and that the remainder of the device driver resides in the mass media storage. Harmer does not teach or suggest that the device contains a set of instructions forming at least a portion of the operating environment, as required by claim 1. Harmer merely teaches that portions of the device driver may reside on both the ROM and the mass media storage.

Regarding independent claim 7, the Advisory Action alleges that enabling means other than BIOS for reading from the media device the information needed to read the required data from the media device cannot be found in the original disclosure.

Regarding claim 7, the specification at page 13 describes that a "block I/O protocol may be defined for use during boot services to abstract mass storage devices, thereby allowing boot services code to perform block I/O without knowing the type of device or its controller." [emphasis added]. In paragraph [0047] on page 17, the specification describes that "a firmware extension 310 also may include a file system driver to support a file system format not supported by the platform firmware. If the OS needs to read files from a file system, the boot media 300 may include a firmware extension 310 that provides a file system driver to access the file system on the boot media 300. [emphasis added] In other words, the specification explicitly describes a

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boot medium having a format, or protocol, that is **unknown** (e.g. unsupported) by the platform firmware. Thus, at boot time, a firmware extension is read from the boot media using a standard block I/O access, in order to provide an extension to the platform firmware that will allow the machine (platform firmware) to read the boot data from the medium. This extension is thus **required** to read the operating system environment portion of the media.

In contrast, Harmer does not teach that the medium is a *boot media*. Harmer does not teach or suggest that the firmware extension resides on boot media to enable reading and loading of a portion of the operating environment – as inherent in the definition of boot media. An advantage of Applicants' claimed machine readable medium is that it may act as a boot medium. The mass storage medium as taught by Harmer cannot. Moreover, Applicants note that the Examiner refused to enter the submitted amendment to recite a "machine-readable boot medium" rather than a "machine-readable medium," in claim 1. The Applicants also attempted to further clarify an operating environment to be an "operating system environment," which was also refused entry. These limitations, at least, further distinguish Applicants' claimed invention from the teaching of Harmer. In the Advisory Action, the Examiner asserted that this amendment was not deemed to place the application in better form for appeal. Applicants respectfully traverse this decision and request that the claims be amended, as in section XI. UN-ENTERED AMENDMENTS, and that the arguments be considered in light of these amendments, or in the alternative that the claims be allowed to issue as is.

With regard to EFIS, Page 1 of EFIS teaches that the EFI is in the form of data tables that contain platform related boot information and boot and runtime services that are available to the OS and its loader. Fig. 2-1 shows an exemplary boot sequence. Page 13 describes, generally, this boot sequence and describes that EFI allows extension of platform firmware by loading EFI driver and EFI application images. However, on page 13 it is also described that EFI supports booting from media containing an EFI OS loader or an EFI-defined system partition. "An EFI system partition is required by EFI to boot from a block device." (Page 13, last paragraph). However, EFIS does not explicitly (or impliedly) teach that the boot media containing an OS loader may be on mass storage that is unreadable, i.e., an unsupported format, to the platform firmware. In contrast, claim 7 requires that "the machine-readable medium in a format that is unreadable by the machine before the machine loads the first set of instructions." This is not taught or suggested by EFIS.

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Similarly, Claim 17 requires "means for extending platform firmware capabilities comprises an extensible firmware interface (EFI) image residing on the self-describing mass storage means, the image providing a software abstraction enabling access to a second portion of the mass storage means comprising at least a portion of the operating system loader, wherein platform firmware of the machine does not have a means to access the second portion of the medium prior to accessing the EFI image." As discussed above, Harmer fails to teach or suggest a system where the mass storage medium comprising at least a portion of the operating system loader, where the platform firmware of the machine does not have a means to access this portion until loading a firmware extension (EFI image) on this self-describing medium. Further, as discussed below, there is no motivation to combine Harmer ad EFIS to extend Harmer with an EFI architecture.

2. *There is no motivation to combine EFIS with Harmer.*

The Final Office Action fails to identify a legally cognizable suggestion for combining EFIS with Harmer. In this regard, on page 3 of the Final Office Action, it is stated: "it would have been obvious for one having ordinary skill in the art at the time of the invention to incorporate EFI as taught by EFIS with the system as disclosed by Harmer for the benefit or permitting faster and easier development of code for a variety of hardware device. However, as a matter of law and fact, this is not a proper suggestion for combining EFIS and Harmer.

Turning first to the legal error, Applicants wishes to remind the Office of the bedrock legal principles for rejecting a claim under 35 U.S.C. § 103. Specifically, in In re Rouffet, 47 U.S.P.Q.2d 1453 (Fed. Cir. 1998) the Federal Circuit explained:

To reject claims in an application under section 103, an examiner must show an unrebutted prima facie case of obviousness. In the absence of a proper prima facie case of obviousness, an applicant who complies with the other statutory requirements is entitled to a patent.

Id. at 1455 (citations omitted and emphasis added).

In the Rouffet case, the Examiner had rejected the pending claims on a combination of references. The Board sustained the Examiner. However, the Federal Circuit reversed the Board's decision and ruled that the Examiner's rejections were legally impermissible because

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they failed to demonstrate a suggestion for combining the references in the manner proposed by the Examiner. As explained by the Federal Circuit:

As this court has stated, “virtually all [inventions] are combinations of old elements.” Therefore, an examiner may often find every element of a claimed invention in the prior art. If identification of each claimed element in the prior art were sufficient to negate patentability, very few patents would ever issue. Furthermore, rejecting patents solely by finding prior art corollaries for the claimed elements would permit an examiner to use the claimed invention itself as a blueprint for piecing together elements in the prior art to defeat the patentability of the claimed invention. Such an approach would be “an illogical and inappropriate process by which to determine patentability.” To prevent the use of hindsight based on the invention to defeat patentability of the invention, this court requires the examiner to show a motivation to combine the references that create the case of obviousness.

Id. at 1457-58 (citations omitted and emphasis added). These principles have not been followed in rejecting claims 1-3, 5-8 and 17-19. Merely stating an advantage or possible advantage of combining references, as was done to reject the claims, is not the same as “show[ing] a motivation to combine the references.”

On the contrary, in order to establish a *prima facie* case of obviousness, there must be actual evidence of a suggestion to modify a prior art reference or to combine two prior art references, and the suggestion to combine or modify the prior art must be clear and particular. In re Dembiczak, 50 U.S.P.Q.2d 1614, 1617 (Fed. Cir. 1999). In order to establish a *prima facie* case of unpatentability, particular factual findings demonstrating the suggestion to combine must be made. See, for example, Ecocolochem Inc. v. Southern California Edison, 56 U.S.P.Q.2d 1065, 1072-73 (Fed. Cir. 2000) and In re Dembiczak, 50 U.S.P.Q.2d 1614, 1617-1618 (Fed. Cir. 1999). Indeed, the law is quite clear that an obviousness rejection must be based on facts, not conjecture.

The Supreme Court... foreclosed the use of substitutes for facts in determining obviousness under section 103. The legal conclusion of obviousness *must be supported by facts*. Where the legal conclusion is not supported by facts it cannot stand.

In re Warner, 379 F.2d 1011, 1017 (C.C.P.A. 1967). This longstanding principle has been followed to date. For example, in the unpublished Board decision, Ex parte Megens, App. No.

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1999-0277 (B.P.A.I. Oct. 29, 1999), the Board stated:

Rejections based on 35 U.S.C. § 103 must rest on a factual basis. In re Warner, 379 F.2d 1011, 1017, 154 USPQ 173, 177-78 (CCPA 1967). In making such a rejection, an examiner has the initial duty of supplying the requisite factual basis and may not, because of doubts that the invention is patentable, resort to speculation, unfounded assumptions or hindsight reconstruction to supply deficiencies in the factual basis. Id.

The examiner's conclusion that it would have been obvious to incline Phillips' loading dock floor 65 rests on the completely unfounded assumption that it would be desirable to drain liquid from the floor. The Phillips reference, however, is devoid of any indication that liquid might accumulate on the floor or that such accumulation would pose a problem even if it did occur. It is therefore apparent that the examiner has resorted to improper speculation and hindsight reconstruction to overcome the admitted deficiency of Phillips vis-à-vis the subject matter recited in claim 1.

(Megens at Pages 4-5)(emphasis added).

This is precisely the situation presented here. The "suggestion" in support of the rejection of the claims amounts to nothing more than a speculative statement that, given the alleged presence of the claim elements in the prior art and an advantage that combining these elements would allegedly achieve, a person skilled in the art would have found it obvious to combine the references to create the claimed invention. The problem with this approach is that it effectively eliminates the requirement of identifying a suggestion for combining references from the obviousness analysis. More specifically, the analysis present in the Final Office Action proceeds in the following manner:

- a) What elements are present in the pending claims?
- b) Can these elements be found in prior art references?
- c) If they can be found, and the references themselves provide no suggestion for combining these elements, can some end or advantage be identified to combine the elements in the manner proposed in the Applicants' claims?
- d) If so, combine the elements in the manner proposed by the Applicants and reject the pending claims.

This mode of analysis is, of course, deeply flawed. Specifically, as noted by the Federal

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Circuit in the Rouffet quote identified above, all of the elements of most claimed inventions can almost always be found in the prior art. Therefore, the answer to step "b" above will almost always be "yes". Since it is a statutory requirement that all inventions have utility, there will also always be an identifiable end or advantage in combining the elements in the prior art in the manner proposed by any claim (e.g., if there was no purpose to an element in a claim it would not be included in the claimed apparatus, after all, who would pursue a claim with superfluous elements or a claim with no utility?). Therefore, if the "suggestion" requirement of 35 U.S.C. § 103 can be met by merely identifying any end or advantage which will be achieved by combining the elements of the prior art references, the suggestion requirement can always be met and is utterly meaningless.

This inherent flaw in the analysis employed in rejecting the claims is elucidated by viewing the alleged "suggestion" the Final Office Action identifies in support of the rejection. As noted above, in rejecting the claims, the Office action states: "it would have been obvious for one having ordinary skill in the art at the time of the invention to incorporate EFI into Harmer to permit faster and easier development of code for a variety of hardware devices." The first part of the statement, namely, "It would have been obvious ... to incorporate" is merely boilerplate language that does not address the suggestion requirement. The second part of the statement, namely, "it would have been obvious for one having ordinary skill in the art at the time of the invention to ..." simply states what the proposed modification of the primary reference is to be; in this case modifying Harmer to include a EFI. This second part of the statement, thus, describes the proposed modification, but offers no explanation of a motivation for making that modification. The final part of the statement, namely, "for the benefit of permitting faster and easier code development..." must, then be the alleged "motivation" for modifying Harmer.

However, while it is true that one possible advantage of firmware extensions is enable self-describing media, that is not a suggestion in and of itself for using an EFI in Harmer. "The mere fact that the prior art may be modified in the manner suggested by the Examiner does not make the modification obvious unless the prior art suggested the desirability of the modification." In re Fritch, 23 U.S.P.Q.2d 1780, 1783-84 (Fed. Cir. 1992)(emphasis added). Here, the Office action does not identify any evidence in the prior art indicating or in any way suggesting the desirability of the proposed modification. It only identifies an old element that has an inherent property. Indeed, the Office action's naked, conclusory statement amounts to

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nothing more than stating “A person of ordinary skill in the art would be motivated to modify Harmer to include EFI because they would want to gain a benefit from having an EFI architecture using block I/O and firmware extensions enabling the reading of self-describing media.” In other words, the Examiner is effectively saying that the motivation of adding EFI to Harmer is to have the inherent benefit of adding EFI. Of course, such circular reasoning (i.e., add “X” to have “X”) cannot be a legally proper tool for identifying a suggestion for combining references. If it were, no combination of old elements would ever be patentable since one can always nakedly state, a person would be motivated to add old element X from one reference to another reference because adding element X offers an advantage (again, if adding “X” had no advantage, who would ever claim it?). Simply put, there is *always* an advantage to combining old elements that can be identified through hindsight *once that combination is known*.

It should be quite clear from the above that merely identifying an advantage for adding an old element to a combination of elements is not a proper suggestion for making that combination. The MPEP further proves this point. In particular, MPEP § 2144 states that “the strongest rationale for combining references is a recognition... in the prior art or... based on established scientific principles or legal precedent, that some advantage would have been produced by their combination.” The MPEP cites In re Sernaker, 702 F.2d 989, 994-95 (Fed. Cir. 1983) to support this proposition.

Looking at the Sernaker case, we see that the Federal Circuit states: “The lesson of this case appears to be that prior art references in combination do not make an invention obvious unless something in the prior art references would suggest the advantage to be derived from combining their teachings.” Sernaker, 702 F.2d at 995-96 (emphasis added). Notice that this statement does not state that it is obvious to combine references simply because there is an advantage to doing so. On the contrary, it carefully states that there can be no obviousness ruling unless something in the art suggests an advantage to combining the references. The advantage itself is not the suggestion, but rather the Court makes it clear that something else suggests the advantage.

The MPEP quote noted above is similar. It states that the “strongest rationale for combining references is a recognition... in the prior art or... based on established scientific principles or legal precedent that some advantage or expected beneficial result would have been produced by their combination.” (MPEP, Page 2100-127) (emphasis added). This, of course,

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does not state that the strongest rationale for combining references is the mere presence of an advantage to doing so. Instead, as in Sernaker, the strongest rationale is a recognition (i.e., a suggestion) in the art that an advantage will result.

As described above, Page 3 of the Final Office Action attempts to combine the teachings of Harmer with EFIS. The Final Office Action claims that the motivation for incorporating EFIS is that it includes the “benefit of abstraction, such that code may be written for a variety of hardware devices without having explicit knowledge of the specifics of each device, citing Page 4, lines 3-5. In fact, EFIS, at the cited references, merely describes that the EFI specification provides OS loader developers with “abstract interfaces that make it possible to build code that works on a range of underlying hardware devices without having explicit knowledge of the specifics for each device in the range.” This paragraph merely describes that the interfaces may be abstracted to work with a variety of hardware. It is not described here that a firmware extension may reside on self-describing media to enable the platform firmware to read other areas of the media having unknown protocols. In fact, EFIS, at the cited location teaches that the abstraction is already resident in the platform firmware, and thus teaches away from Applicants’ claimed invention. Thus, even if combination of the references were to be deemed proper, this combination would not result in Applicants’ claimed invention.

B. Claims 4 and 20 are patentable over Harmer and the EFIS in view of BIOS Updates.

Appellant respectfully traverses the § 103(a) rejection of claims 4 and 20 over Harmer and EFIS and further in view of BIOS Updates. A prima facie case of obviousness has not been established, because the references as combined fail to teach or suggest all elements of the claims.

Regarding the § 103(a) rejections of claims 4 and 20, the proposed addition of BIOS Updates, even if it were proper, fails to cure the deficiencies noted above in Harmer and EFIS with respect to claims 1 and 7 and 17.

C. Claims 9-11 and 13-16 are patentable over Harmer and the EFIS in view of Rakavy et al.

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Appellant respectfully traverses the § 103(a) rejection of claims 9-11 and 13-16 over Harmer and EFIS and further in view of Rakavy et al. A prima facie case of obviousness has not been established, because the references as combined fail to teach or suggest all elements of the claims.

Regarding the § 103(a) rejections of claims 11-13, the proposed addition of Rakavy et al., even if it were proper, fails to cure the deficiencies noted above in Harmer and EFIS with respect to claims 1, 7 and 17.

Regarding claims 11 and 13, Rakavy et al., even in combination with Harmer and EFIS fail to disclose “loading and running an operating system loader from the boot media using the one or more loaded firmware extensions, the one or more loaded firmware extensions enabling the system to access the operating system loader from a portion of the boot media inaccessible to the unextended platform firmware....”

The Examiner admits that Harmer does not teach or disclose that the medium may contain a portion of the operating system or operating system loader. The Examiner asserts that Rakavy et al. teach this element. Rakavy et al. teach a method and system for communicating with a computer through a network prior to booting the computer’s operating system. Rakavy et al. teach a method to retrieve BIOS enhancements over a network. At no time do Rakavy et al. teach or disclose a system with an EFI architecture where the EFI enables extension of platform firmware where one or more loaded firmware extensions retrieved from the boot media enable the system to access the operating system loader from a portion of the boot media that was **inaccessible to the unextended platform firmware**. Nor do Rakavy et al. suggest that combining with an architecture such as taught by EFIS would be beneficial. Instead Rakavy et al. teach that a bootstrap loader may be retrieved during POST from a **predetermined location** on the boot device. (Col. 2, lines 27-28). This teaches away from Applicants’ claimed invention requiring a *self-describing machine-readable medium*, where the location of the loader is not only unknown, but unreadable until the firmware extensions are loaded. Applicants’ claimed invention requires that the operating system or OS loader reside on a portion of the medium that is inaccessible to the firmware until such time as a firmware extension is retrieved from the medium, where the firmware extension enables the firmware to access the OS or loader portion from the medium (boot device). Rakavy et al. discuss that optional hardware devices may be initialized using option-ROM (aka firmware extension).

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On page 7 of the Final Office Action, it is alleged that Rakavy et al. teaches that the medium contains an OS loader to be loaded after POST, citing Col. 2, lines 27-34. Rakavy et al. merely describes the normal boot process from a boot device. However, Harmer does not teach that the medium is a boot device having a portion of an operating system environment. On page 6 of the Final Office Action, it is alleged that Harmer teaches that "the portion of the *operating system* comprises data that may include, but is not limited to, system configuration information, data, text, passwords, or any other information that may provide some purpose during the start-up of the system," citing Col. 16, lines 20-24. In fact, Harmer teaches *operating data*, and not an operating system. Further, it will be apparent to those of skill in the art that in this context, data does not mean "instructions." A number of possible types of data were enumerated, however, Harmer is specifically silent on including boot code, or instructions, used to actually boot the system or load the OS. This omission is intended, as the system taught by Harmer would not be able to boot from the medium. Harmer explicitly teaches that the expansion BIOS disclosed enable initialization and operation of the media device. Harmer does not teach or suggest that a portion of the operating system environment is stored on the media. Thus, there is no motivation to combine the teaching of Rakavy et al. with the teaching of Harmer, and further, even if combined, would not result in the claimed invention. The OS loader, as taught by Rakavy et al., would necessarily need to be on a different medium than the expansion BIOS, as taught by Harmer, and Harmer's expansion BIOS cannot be a boot medium, as described.

Moreover, as described above, generally regarding motivation to combine for §103 rejections, the Examiner has improperly asserted a motivation which begs the question. On page 7 of the Final Office Action, it is alleged that the motivation is because "it serves a purpose during start-up of the system." There is no suggestion in Harmer that the medium in question actually has an OS loader, or any other instructions that would boot the operating system. There is no suggestion in either Harmer or Rakavy et al. that would suggest using EFI images for firmware expansion. Thus, for at least these reasons, the combination of references, including EFIS, is not only improper, but will not result in Applicants' claimed invention.

On page 9 of the Final Office Action, it is alleged that the motivation to combine EFIS with Harmer and Rakavy et al. "includes the benefit of abstraction, such that code may be written for a variety of hardware devices without having explicit knowledge of the specifics for each device." This motivation begs the question and is conclusory, as discussed above. It does not

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meet the test for combining references in a § 103 rejection and is therefore improper and should be withdrawn.

D. Claim 12 is patentable over Rakavy et al., Harmer and EFIS, and further in view of UTR.

Appellant respectfully traverses the § 103(a) rejection of claim 12 over Rakavy et al., Harmer and EFIS in view of UTR. A prima facie case of obviousness has not been established, because the references as combined fail to teach or suggest all elements of the claims.

Regarding the § 103(a) rejections of claim 12, the proposed addition of UTR, even if it were proper, fails to cure the deficiencies noted above in Harmer, Rakavy et al., and EFIS with respect to parent claim 7.

CONCLUSION

For the reasons set forth above, Appellant respectfully solicits the Honorable Board to reverse the Examiner's rejection of claims 1-20.

To the extent necessary, a petition for an extension of time under 37 C.F.R. § 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account No. 50-0221 and please credit any excess fees to such deposit account.

Respectfully submitted,

Dated: 29 Sep. 2006

s / Joni D. Stutman-Horn /

Joni D. Stutman-Horn

Registration No. 42,173

c/o Intel Americas
LF2
4040 Lafayette Center Drive
Chantilly, VA 20151
(703) 633-6845

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VIII. CLAIMS APPENDIX

1. A system comprising:

a central processor;

a non-volatile memory coupled with the central processor and storing platform firmware;

an extensible firmware interface (EFI) comprising data tables having platform-related information, a loader for an operating environment, and boot and runtime service calls available to the operating environment, wherein the EFI enables extension of platform firmware by loading driver and application images, which when loaded, have access to all EFI defined runtime and boot services; and

a machine-readable medium coupled with the central processor, the machine-readable medium to be used in initializing the operating environment for the system upon power up, the machine-readable medium comprising a first set of instructions forming at least a portion of the operating environment, and a second set of instructions defining one or more firmware extensions to enable the system to access the first set of instructions, wherein the one or more firmware extensions comprise a self-describing media module.

2. The system of claim 1, wherein the machine-readable medium comprises a hard disk platter.

3. The system of claim 2, wherein the one or more firmware extensions comprise a file system driver to support a file system format not supported by the platform firmware.

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4. The system of claim 1, wherein the non-volatile memory comprises random access non-volatile memory.

5. The system of claim 1, wherein the central processor comprises a central processing unit housed in a single chip.

6. The system of claim 5, further comprising:
a volatile memory; and
a motherboard coupling the volatile memory, the non-volatile memory and the machine-readable medium with the central processing unit.

7. A self-describing machine-readable medium comprising:
a first set of instructions in a first portion of the medium defining operations for enabling a machine to access a second set of instructions in a second portion of the medium comprising at least a portion of an operating system stored on the machine-readable medium in a format that is unreadable by the machine before the machine loads the first set of instructions, wherein the first set of instructions comprises at least one extensible firmware interface (EFI) image providing a software abstraction enabling access to the second portion of the medium, wherein platform firmware of the machine does not have a mechanism to access the second portion of the medium prior to accessing the EFI image; and
the second set of instructions.

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8. The machine-readable medium of claim 7, wherein the first set of instructions comprise one or more extensions to platform firmware capability.

9. The machine-readable medium of claim 8, wherein the portion of an operating system comprises an operating system loader.

10. The machine-readable medium of claim 9, wherein the one or more extensions to platform firmware capability comprise a file system driver to support a file system format used to store at least a portion of the second set of instructions.

11. The machine-readable medium of claim 9, wherein the one or more extensions to platform firmware capability comprise glyphs that represent a language.

12. The machine-readable medium of claim 9, wherein the one or more extensions to platform firmware capability comprise a Unicode collation module.

13. A machine-implemented method for extending platform firmware capabilities, the method comprising:

loading on a system one or more firmware extensions from a boot media;

booting the system; and

loading and running an operating system loader from the boot media using the one or more loaded firmware extensions, the one or more loaded firmware extensions enabling the system to access the operating system loader from a portion of the boot media inaccessible to the

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unextended platform firmware, wherein the one or more firmware extensions are compatible with an extensible firmware interface (EFI) comprising data tables having platform-related information, a loader for an operating system, and boot and runtime service calls available to the operating system, wherein the EFI enables extension of platform firmware by loading application images, which when loaded, have access to all EFI defined runtime and boot services, the system having an EFI architecture.

14. The machine-implemented method of claim 13, wherein loading one or more firmware extensions from a boot media during a system boot comprises using a block input/output protocol to abstract a mass storage device containing the boot media.

15. The machine-implemented method of claim 14, wherein the one or more firmware extensions comprise a file system driver to support a file system format used to store data on the boot media.

16. The machine-implemented method of claim 15, wherein the one or more firmware extensions further comprise glyphs that represent a language.

17. A data processing system comprising:
means for processing instructions and data;
non-volatile memory means for storing platform firmware; and
self-describing mass storage means providing means for extending platform firmware capabilities during system booting before an operating system loader is loaded and run, wherein

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means for extending platform firmware capabilities comprises an extensible firmware interface (EFI) image residing on the self-describing mass storage means, the image providing a software abstraction enabling access to a second portion of the mass storage means comprising at least a portion of the operating system loader, wherein platform firmware of the machine does not have a means to access the second portion of the medium prior to accessing the EFI image.

18. The system of claim 17, wherein the mass storage means comprises an optical disk.

19. The system of claim 18, wherein the means for extending platform firmware capabilities comprise a file system driver to support a file system format not supported by the platform firmware.

20. The system of claim 19, wherein the non-volatile memory means comprises random access non-volatile memory.

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IX. EVIDENCE APPENDIX

None.

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X. RELATED PROCEEDINGS APPENDIX

None.

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XI. UN-ENTERED AMENDMENTS

1. (currently amended) A system comprising:

a central processor;

a non-volatile memory coupled with the central processor and storing platform firmware;

an extensible firmware interface (EFI) comprising data tables having platform-related information, a loader for an operating system environment, and boot and runtime service calls available to the operating system environment, wherein the EFI enables extension of platform firmware by loading driver and application images, which when loaded, have access to all EFI defined runtime and boot services; and

a machine-readable boot medium coupled with the central processor, the machine-readable boot medium to be used in initializing the operating system environment for the system upon power up, the machine-readable medium comprising a first set of instructions forming at least a portion of the operating system environment, and a second set of instructions defining one or more firmware extensions to enable the system to access the first set of instructions, wherein the one or more firmware extensions comprise a self-describing media module.

2. (original) The system of claim 1, wherein the machine-readable medium comprises a hard disk platter.

3. (original) The system of claim 2, wherein the one or more firmware extensions comprise a file system driver to support a file system format not supported by the platform firmware.

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4. (original) The system of claim 1, wherein the non-volatile memory comprises random access non-volatile memory.
5. (original) The system of claim 1, wherein the central processor comprises a central processing unit housed in a single chip.
6. (original) The system of claim 5, further comprising:
 - a volatile memory; and
 - a motherboard coupling the volatile memory, the non-volatile memory and the machine-readable medium with the central processing unit.

7. (previously amended) A self-describing machine-readable medium comprising:
 - a first set of instructions in a first portion of the medium defining operations for enabling a machine to access a second set of instructions in a second portion of the medium comprising at least a portion of an operating system stored on the machine-readable medium in a format that is unreadable by the machine before the machine loads the first set of instructions, wherein the first set of instructions comprises at least one extensible firmware interface (EFI) image providing a software abstraction enabling access to the second portion of the medium, wherein platform firmware of the machine does not have a mechanism to access the second portion of the medium prior to accessing the EFI image; and
 - the second set of instructions.

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8. (original) The machine-readable medium of claim 7, wherein the first set of instructions comprise one or more extensions to platform firmware capability.

9. (original) The machine-readable medium of claim 8, wherein the portion of an operating system comprises an operating system loader.

10. (original) The machine-readable medium of claim 9, wherein the one or more extensions to platform firmware capability comprise a file system driver to support a file system format used to store at least a portion of the second set of instructions.

11. (original) The machine-readable medium of claim 9, wherein the one or more extensions to platform firmware capability comprise glyphs that represent a language.

12. (original) The machine-readable medium of claim 9, wherein the one or more extensions to platform firmware capability comprise a Unicode collation module.

13. (previously amended) A machine-implemented method for extending platform firmware capabilities, the method comprising:

loading on a system one or more firmware extensions from a boot media;

booting the system; and

loading and running an operating system loader from the boot media using the one or more loaded firmware extensions, the one or more loaded firmware extensions enabling the system to access the operating system loader from a portion of the boot media inaccessible to the

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unextended platform firmware, wherein the one or more firmware extensions are compatible with an extensible firmware interface (EFI) comprising data tables having platform-related information, a loader for an operating system, and boot and runtime service calls available to the operating system, wherein the EFI enables extension of platform firmware by loading application images, which when loaded, have access to all EFI defined runtime and boot services, the system having an EFI architecture.

14. (original) The machine-implemented method of claim 13, wherein loading one or more firmware extensions from a boot media during a system boot comprises using a block input/output protocol to abstract a mass storage device containing the boot media.

15. (original) The machine-implemented method of claim 14, wherein the one or more firmware extensions comprise a file system driver to support a file system format used to store data on the boot media.

16. (original) The machine-implemented method of claim 15, wherein the one or more firmware extensions further comprise glyphs that represent a language.

17. (previously amended) A data processing system comprising:
means for processing instructions and data;
non-volatile memory means for storing platform firmware; and
self-describing mass storage means providing means for extending platform firmware capabilities during system booting before an operating system loader is loaded and run, wherein

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means for extending platform firmware capabilities comprises an extensible firmware interface (EFI) image residing on the self-describing mass storage means, the image providing a software abstraction enabling access to a second portion of the mass storage means comprising at least a portion of the operating system loader, wherein platform firmware of the machine does not have a means to access the second portion of the medium prior to accessing the EFI image.

18. (original) The system of claim 17, wherein the mass storage means comprises an optical disk.

19. (original) The system of claim 18, wherein the means for extending platform firmware capabilities comprise a file system driver to support a file system format not supported by the platform firmware.

20. (original) The system of claim 19, wherein the non-volatile memory means comprises random access non-volatile memory.